1. INTRODUCTION

EPA headquarters and a national site assessment workgroup produced this guidance for regional, State, and contractor staff who manage or perform preliminary assessments (PAs). We have focused this guidance on the types of sites and site conditions most commonly encountered. The PA approach described in this guidance is generally applicable to a wide variety of sites. However, because of the variabilitv among sites, the amount of information available, and the level of investigative effort required, we cannot provide guidance that is equally applicable to all sites. As a PA investigator, you should recognize this limitation and be aware that some sites--particularly Federal facilities, Environmental Priorities Initiative (EPI) sites, and sites that have previously been extensively investigated by EPA or others, – may require deviations from this guidance.

1.1 PURPOSE OF THIS GUIDANCE

This guidance instructs you how to conduct a PA and report results. This guidance discusses the information required to evaluate a site and how to obtain it, how to score a site, and reporting requirements. This document also provides guidelines and instruction on PA evaluation, scoring, and the use of standard PA scoresheets. The overall goal of this guidance is to help you conduct high-quality assessments that result in correct site screening or further action recommendations. By following this guidance, you will create nationally consistent PA's on a nationally consistent basis.

This document is structured as follows:

- **!** Section 1, Introduction: Tells you the purpose and implementation of Superfund legislation, discusses the structure of the Superfund process, and provides specific detail on the purpose and role of the PA in the site assessment process.

- **!** Section 2, Conducting the PA Investigation: Discusses how you should gather data for the PA, including types of sites encountered, conducting file searches, gathering additional "desktop" information, and preparing for and conducting site reconnaissance.

- **!** Section 3, Site Evaluation and Scoring: Shows you, factor-by-factor, how to evaluate the data collected to develop a site score using PA scoresheets. Section 3 also discusses the role of professional judgement in site evaluation.

- **!** Section 4, Reporting Requirements: Discusses the information needs for PA reporting, shows the outline of a standard PA report, and addresses the use of a standard form for recording site characteristics information.

- **!** Section 5, Reviews: Gives you guidelines to review the site evaluation and score, discusses critical aspects of the evaluation that may impact site disposition, and provides guidelines to apply analytical data.

1.2 CERCLA/SARA LEGISLATION

In 1980, Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, to respond to the threats posed by uncontrolled releases of hazardous substances into the environment. Section 105 of CERCLA required EPA to establish criteria for determining priorities among releases or threatened releases of

hazardous substances for the purpose of taking remedial action. To meet this requirement, EPA developed the Hazard Ranking System (HRS) (47 FR 31180, July 16, 1982) to evaluate sites for possible inclusion on the National Priorities List (NPL). The NPL includes those sites that appear to pose the most serious threats to public health or the environment Sites on the NPL are eligible for Superfund-financed remedial action.

The Superfund Amendments and Reauthorization Act of 1986 (SARA) required EPA to revise the HRS to more accurately "assess the relative degree of risk to human health and the environment posed by sites." SARA also required the HRS to take into account recreational use of surface waters, contamination of the human food chain and drinking water supplies, and potential contamination of ambient air. EPA revised the HRS in response to these mandates (55 FR 51532, December 14, 1990). The revised HRS requires more data than the original HRS, and we have restructured the site assessment process accordingly. In Changing the site assessment process, we have balanced the need to accurately assess site conditions with the need to converse resources.

1.3 THE SUPERFUND PROCESS

EPA uses a structured program to determine appropriate response for Superfund sites (Figure 1-1):

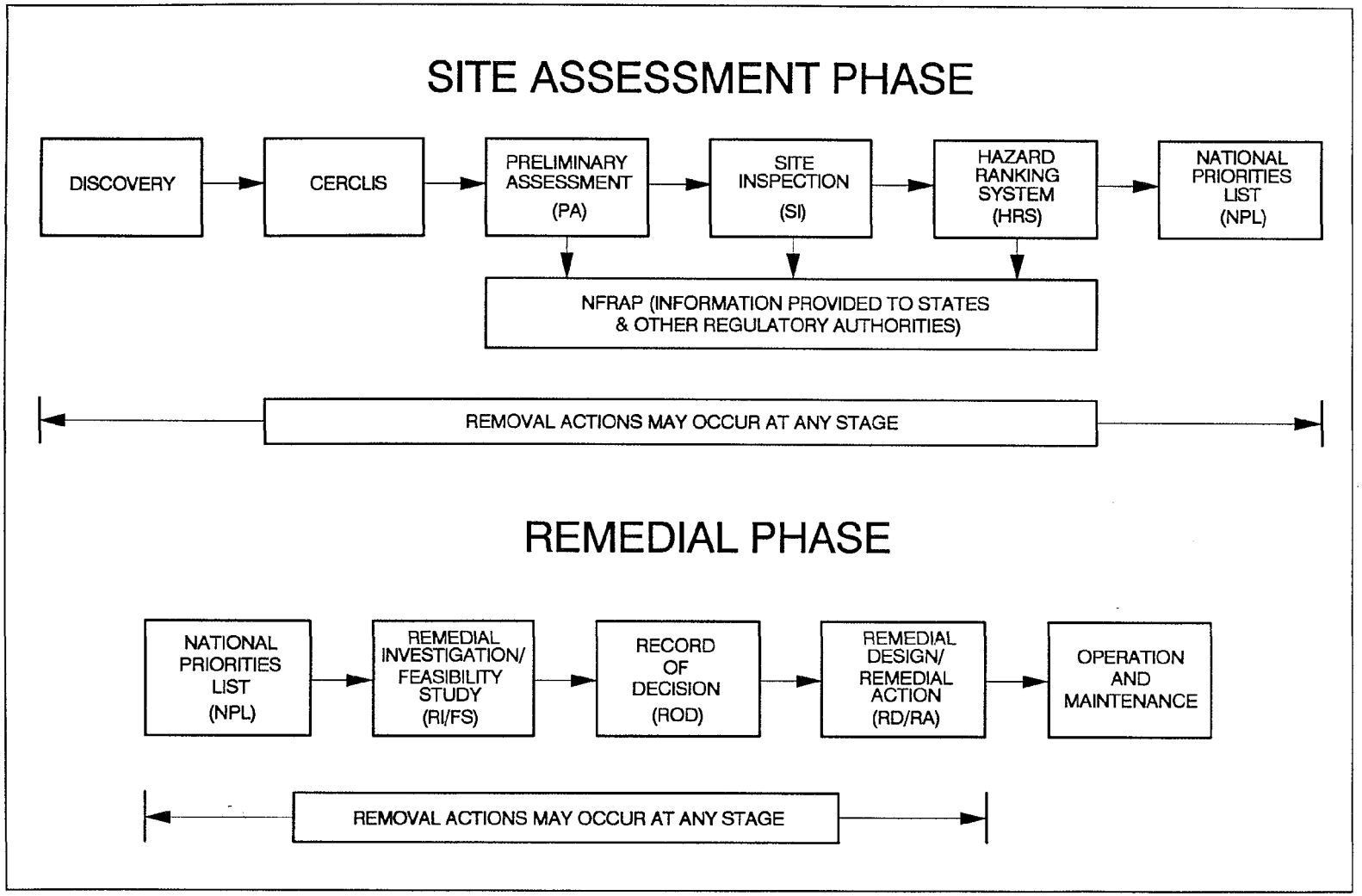
- The site assessment phase identifies sites for the NPL.
- The remedial phase determines the extent of contamination and implements cleanup remedies.

The primary objective of the site assessment phase is to obtain the data necessary to identify the highest priority sites posing threats to human health and the environment. The site assessment phase begins with site discovery, or notification to EPA of possible releases of hazardous substances. Sites are discovered by regional EPA offices, State agencies, and citizens who file a PA petition. Section 105(d) of SARA established the PA petition as a formal mechanism for citizens to report potential hazardous waste sites. Publication 9200.5-301 FS, "Preliminary Assessment Petition, by EPA's Office of Emergency and Remedial Response, describes the process. Once discovered, sites are entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), EPA's computerized inventory of potential hazardous waste sites. EPA then evaluates the potential for a release of hazardous substances from a site during two investigative steps:

- Preliminary Assessment: A PA is a limited-scope investigation performed by States and/or EPA on every CERCLIS site. PA investigators collect readily available information and conduct a site and environs reconnaissance. The PA distinguishes between sites that pose little or no threat to human health and the environment and sites that require further investigation. The PA also identifies sites requiring assessment for possible emergency response actions.

- Site Inspection (SI): If the PA recommends further investigation, an Sl is performed. Sl investigators typically collect waste and environmental samples to determine the substances present at a site and whether they are being released to the environment. The primary objective of the Sl is to identify which sites have a high probability of qualifying for the NPL. A second objective is to identify sites posing immediate health or environmental threats which require emergency response.

Figure 1-1
The Superfund Process



At the end of both the PA and SI, EPA applies the HRS to derive a site score and determine either that further investigation is necessary or that the site should receive a "no further remedial action planned" (NFRAP) recommendation. A NFRAP recommendation means that further action under the Federal Superfund program is not planned; however, such sites may be reexamined later if warranted. File information for NFRAP sites is provided to the State, or other regulatory authorities, which may also take action on their own.

The SI can be conducted in one stage or two. Often, the SI can be structured to test the critical PA conclusions that resulted in the recommendation for an SI; the information developed may be sufficient for EPA to determine either that the site requires no further action or that it is likely to score high enough for NPL consideration. If further investigation is necessary to document an HRS score, an expanded Sl can be conducted. A site with an HRS score of 28.50 or greater is eligible for proposal to the NPL, and a formal HRS package may be prepared.

These steps -- discovery, entry into CERCLIS, PA, SI, expanded SI (if warranted), HRS package preparation, and placement on the NPL -- make up the site assessment phase of the Superfund process. An important aspect of this process is its screening function, identifying sites that will not score high enough or are otherwise ineligible for the NPL, and removing them from further consideration. While all sites in CERCLIS undergo a PA, only about 3 out of 5 (historically) have been found to require an SI, and only 1 in about 15 or 20 warrant placement on the NPL.

Decisions made during the site assessment phase determine which sites are addressed during the remedial phase of the Superfund program. The objective of the remedial phase is to implement remedies that eliminate, reduce, or control risks to human health and the environment. Investigations and analyses identify the best cleanup alternative for a site:

- Remedial Investigation (RI): An RI is conducted at all NPL sites. The RI is a field investigation to characterize the nature and extent of contamination at a site. The RI supports development, evaluation, and selection of the appropriate response alternative.

- Feasibility Study (FS): Based on the data collected during the RI, options for final remedial actions are developed and evaluated in the FS. The most viable cleanup options are evaluated based on several criteria: ability to protect human health and the environment; long- and short-term effectiveness; ability to comply with applicable State and Federal requirements; ability to reduce waste toxicity, mobility, or volume; implementability; State and community acceptance; and cost.

- Record of Decision (ROD): After all facts about a site have been evaluated, EPA selects a final remedy and prepares a ROD. The ROD supports selection of the final remedy by documenting all facts, analyses, and policy considerations.

- Remedial Design/Remedial Action (RD/RA): The RD/RA stage includes development of the actual design of the selected remedy and implementation of the remedy through construction.

The final steps in the Superfund process include initiating long-term operation and maintenance of the site, where necessary.

1.4 PURPOSE AND SCOPE OF THE PA

The purpose of the PA is to differentiate sites that pose little or no potential threat to human health and the environment from sites that warrant further investigation. The PA also supports

emergency response and removal activities, fulfills public information needs, and generally furnishes appropriate information about the site early in the site assessment process.

The scope of the PA is defined in Section 420 of the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300), commonly known as the NCP. As the first stage of investigation conducted for every site in CERCLIS, the PA is a relatively quick, low-cost compilation of existing information about the site and its surrounding area, with an emphasis on obtaining comprehensive information on targets -- that is, people and resources that might be threatened by a release from the site. A PA generally involves a reconnaissance of the site and its environs. Sampling is generally not conducted during a PA. The scope of the PA must be sufficient to complete a number of tasks:

- Review existing information about the site.
- Conduct a site and environs reconnaissance.
- Collect additional information about the site, with an emphasis on target information.
- Evaluate all information and develop a site score.
- Prepare a brief site summary report and site characteristics form.

Developing an HRS score usually requires extensive analytical data along with a large amount of other information about the site and its surroundings. At the PA stage, where the scope of investigation and available hours are limited, it is not generally practical to apply the HRS in its entirety. Consequently, to implement the HRS as a screening tool at the PA stage, EPA has developed a simplified evaluation approach to quantitatively assess a limited number of HRS factors. The selected factors are strong indicators of the potential site score and can be evaluated within the scope of the PA. Other important HRS considerations that are not readily available at the PA are evaluated qualitatively. PA scoresheets (Appendix A) identify and provide instruction for the quantitative and qualitative evaluation of the critical HRS factors. This scoring methodology uses reasonable default values and truncated evaluations for factors not critical to the site score.

The PA described in this document typically requires an **average** of about 120 hours to complete. Some PAs may require more hours if the site is complex and if additional effort is likely to strengthen the recommendation regarding site disposition, particularly a NFRAP recommendation. On the other hand, fewer hours may be needed for relatively straightforward sites that clearly warrant further investigation, sites with extensive existing file information, or sites ineligible for CERCLA remedial action based on statutory or policy requirements. Based on a pilot study EPA conducted in 1991 (see Figure 1 -2), the range of hours required for PA activities at typical sites is estimated as follows:

PA Activity	Typical Range of Hours
Collection information	60 - 80
Reconnaissance	10 - 20
Scoring	5 - 15
Reporting	20 - 30
Average total	120

Figure 1-2
PA Pilot Study Results

EPA conducted a pilot study to test the PA approach described in this document. The study included 27 sites in EPA Regions 2, 5, and 10, essentially randomly selected from CERCLIS. The sites were already scheduled for PAs and there were no previous EPA investigations at any of them. Hours to perform the PA were tracked for 22 of the 27 sites and reported in four major categories:

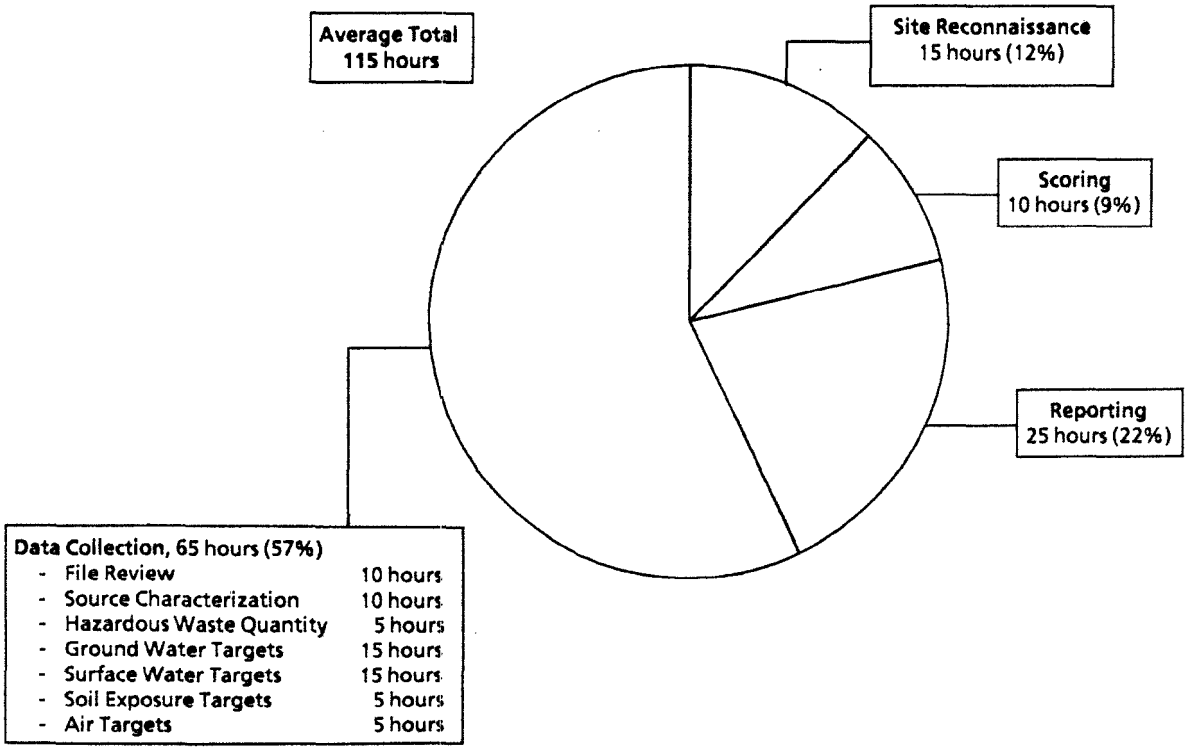
- Data collection
- Site reconnaissance
- Scoring (PA scoresheets)
- Reporting (narrative report and site characteristics data form)

An approximate breakdown of hours is shown in the pie chart below. Significant results of the pilot study include:

- Data collection accounted for more than half of the hours expended; targets identification alone required more than one-third of the total.

- Hours required to complete the PA ranged from 66 to 181.

  -- 18 of the 22 sites ranged from 93 to 149 hours.
  -- The average total was 116 hours; the median was 113 hours.



The data and conclusions documented for the PA are the foundation of all future Superfund activity. The PA is a critical stage in the site assessment process; sites must be accurately characterized because incorrect site recommendations could waste resources or even endanger human health and the environment. The PA evaluation approach detailed in this guidance supports this requirement and ensures nationally consistent data collection and documentation, resulting in quantitative, defensible site screening recommendations within a limited budget.

1.5 STRUCTURE OF THE PA

PA site evaluation follows the structure of the HRS and is divided into four hazardous substance exposure routes called pathways: three migration pathways (ground water, surface water, and air) and one exposure pathway (soil exposure). Each pathway represents a means by which hazardous substances may pose a threat to human health and/or the environment.

Pathway	Accounts for
Ground Water	Hazardous substance migration to and within aquifers; potential threats to drinking water supplies.
Surface Water	Hazardous substance migration to surface water bodies; potential threats to drinking water supplies, the human food chain, and sensitive environments.
Soil Exposure	Potential threat to people on or near the site who may come into contact with exposed wastes or areas of suspected contamination. This includes both soil ingestion and dermal exposure.
Air	Hazardous substance migration, in gaseous or particulate form, through the air; potential threats to people and sensitive environments.

Each pathway consists of three factor categories. The PA investigator collects a variety of information to evaluate these factor categories.

Factor Category	Represents
Likelihood of Release	Relative likelihood of a hazardous substance migrating from the site through the specific pathway medium (ground water, surface water, air).
Targets	Presence of people, physical resources (drinking water wells or surface water intakes), and environmental resources (sensitive environments, fisheries) that might be threatened by release of a hazardous substance from the site.
Water Characteristics	An estimation of the type and quantity of hazardous wastes at the site.

The basic units of site assessment evaluation are called factors. Each factor is assigned a score on the basis of specific data about that factor. Each factor category consists of a set of related factors. Table 1-1 lists the factors requiring explicit PA evaluation, by pathway and factor category.

The PA investigator must collect the necessary information to meet two goals:

- Accurately and completely support a site disposition recommendation, and
- Provide information useful to the SI that may follow.

1.6 PA TERMINOLOGY

Some PA terms differ slightly from HRS terms. HRS terms have highly specific meaning and were developed to meet the needs of HRS scoring. PA terminology differs because information available during the PA may be limited, and the principal objective of the PA is to support a recommendation regarding the need for further investigation and possible subsequent HRS scoring.

The glossary beginning on page 161 defines most PA terms in this document. PA scoring factors are also defined in conjunction with factor discussions in Sections 3.3 through 3.6. Several terms that are not necessarily pathway-specific, but apply broadly throughout the PA evaluation, are defined in the following sections.

1.6.1 General Terms

Factor: The basic elements of site assessment requiring data collection and evaluating for scoring purposes.

Table 1-1
PA Factors by Pathway

	Factors Within Factor Categories		
Pathway	**Likelihood of Release**	**Waste Characteristics**	**Targets**
Ground Water	Suspected Release No suspected Release Depth to Aquifer	Hazardous Waste Quantity	Primary Target Population Secondary Target Population Nearest Drinking Water Well Wellhead Protection Area Resources
Surface Water	Suspected Release No Suspected Release Distance to Surface Water Flood Frequency	Hazardous Waste Quantity	Primary Target Population Secondary Target Population Nearest Drinking Water Intake Resources Primary Target Fisheries Secondary Target Fisheries Primary Target Sensitive Environments Secondary Target Sensitive Environments
Soil Exposure	Suspected Contamination	Hazardous Waste Quantity	Resident Population Resident Individual Workers Terrestrial Sensitive Environments Resources Nearby Population
Air	Suspected Release No Suspected Release	Hazardous Waste Quantity	Primary Target Population Secondary Target Population Nearest Individual Primary Target Sensitive Environments Secondary Target Sensitive Environments Resources

Factor category: A set of related factors. Each pathway consists of three factor categories--likelihood of release or exposure, targets, and waste characteristics.

Pathway: The environmental medium through which a hazardous substance may threaten targets. The PA evaluates the migration and threat potential through the ground water, surface water, air, and soil exposure pathways.

Source: An area where a hazardous substance may have been deposited, stored, disposed, or placed. Also, soil that may have become contaminated as a result of hazardous substance migration. In general, however, the volumes of air, ground water, surface water, and surface water sediments that may have become contaminated through migration are not considered sources.

Site: The area consisting of the aggregation of sources, the areas between sources, and areas that may have been contaminated due to migration from sources; site boundaries are independent of property boundaries.

Hazardous substance or hazardous constituent: Material defined as a hazardous substance, pollutant, or contaminant in CERCLA Sections 101(14) and 101 (33).

Hazardous waste: Any material suspected to contain a hazardous substance, pollutant, or contaminant that is or was in a source.

1.6.2 Terms Relating to Releases

Suspected release: A professional judgment conclusion based on site and pathway conditions indicating that a hazardous substance is likely to have been released to the environment. (Suspected release is the PA term analogous to the HRS "observed release.")

No suspected release: A professional judgement conclusion based on site and pathway conditions indicating that a hazardous substance is not likely to have been released to the environment. (No suspected release is the PA term analogous to the HRS "potential to release.")

1.6.3 Terms Relating to Targets

Target: A physical or environmental receptor that is within the target distance limit for a particular pathway. Targets may include wells and surface water intakes supplying drinking water, fisheries, sensitive environments, and resources.

Target population: The human population associated with the site and/or its targets. Target population consist of those people who use target wells or surface water intakes supplying drinking water, consume food chain species taken from fisheries, or are regularly present on the site or within target distance limits.

Target distance limit The maximum distance over which targets are evaluated. The target distance limit varies by pathway: ground water and air pathways -- a 4-mile radius around the site; surface water pathway -- 15 miles downstream from the probable point of entry to surface water; soil exposure pathway -- 200 feet (for the resident population threat) and 1 mile (for the nearby population threat) from areas of known or suspected contamination.

Primary target: A target which, based on professional judgement of site and pathway conditions and target characteristics, has a relatively high likelihood of exposure to a hazardous substance. To score a primary target, a suspected release must first be hypothesized; however, a suspected release is not in itself sufficient to score primary targets. (Primary target is the PA term analogous to the HRS target exposed to Level I or Level II actual contamination.)

Secondary target: A target which, based on professional judgement of site and pathway conditions and target characteristics, has a relatively low likelihood of exposure to a hazardous substance. If a release is suspected, there may be both primary targets and secondary targets. However, if no release is suspected, all targets are scored as secondary targets. (Secondary targets is the PA term analogous to the Hrs target exposed to potential contamination.)